Questioned Documents Unit (QDU)
Procedures for Processing Evidence Using Leucocrystal Violet (LCV)
Section 3

1 Scope

This document applies to examiners and analysts in the QDU for the enhancement of patterned impressions in blood.

2 Equipment/Materials/Reagents

- Balance
- Weighing pans
- Spatulas
- Beakers (10 ml - 2000 ml)
- Magnetic stirrer
- Magnetic stirring bars
- Squirt bottles or spray bottles
- Fume hood (optional)
- Disposable gloves
- Lab coat
- Protective eyewear
- Dust/Mist mask
- 5-Sulfosalicylic acid
- 3% Hydrogen Peroxide
- Sodium Acetate
- Leucocrystal Violet
- Tap water

3 Standards and Controls

3.1 Leucocrystal Violet Solution

Prepared in a l liter beaker on a magnetic stirring device. Dissolve 10 grams of 5-Sulfosalicylic acid in 500 ml of 3% Hydrogen Peroxide. Add 3.7 grams of Sodium Acetate and 1 gram of Leucocrystal Violet. If the LCV crystals are yellow instead of white, then do not use. This is an indication that the reagent is old and the resulting solution will not be effective. The LCV solution will be tested on a positive control blood stain prior to use.

A positive reaction will produce a violet color.

Record the results of the control test in the *Chemical Enhancement and Control Logbook* located in the Shoeprint examination room.

The LCV solution can be stored in dark bottles for up to 30 days.

4 Sampling

Not Applicable.

5 Procedure

5.1 The LCV solution may be applied by spraying the item to be enhanced with an aerosol sprayer or cascading the liquid with a squeeze bottle. The color reaction should occur within 30 seconds. The enhanced impression should be rinsed with tap water after enhancement and allowed to dry.

5.2 At the completion of chemical enhancement, refer to the *QDU Procedures for Conducting Footwear and Tire Tread Examinations*.

6 Calculations

Not Applicable.

7 Measurement Uncertainty

Not Applicable.

8 Limitations

The color of the background substrate must be tested prior to use of this solution. LCV and hydrogen peroxide will react with blood to produce a violet color. If the background substrate is similar in color to violet, then it will obscure the chemically enhanced impression.
If the enhancement occurs outdoors or in intense light, then the impression should be photographed as soon as possible since photo ionization of the dye may occur, creating a violet background. If the background also stains a violet color, then it will obscure the chemically enhanced impression.

9 Safety

9.1 Adhere to the safety practices outlined in the *FBI Laboratory Safety Manual*.

9.2 Handle any specimens containing known or possible biohazards in accordance with FBI Laboratory health and safety practices.

9.3 When processing evidence in the laboratory, a fume hood will be used when the solution is sprayed with an aerosol sprayer. When the solution is being used as a search or enhancement reagent at a crime scene, a dust/mist mask should be worn.

9.4 Dispose of all chemicals according to the *Chemical Disposal Guidelines* on file in the Shoeprint examination room.

9.5 Safety information concerning each of the chemicals used in these procedures are available from the *Material Safety Data Sheets (MSDS)* on file in the Shoeprint examination room.

10 References

FBI - Chemical Formulas and Processing Guide for Developing Latent Prints, Revised 2000

FBI Laboratory Safety Manual

QDU Quality Assurance Manual

QDU Standard Operating Procedures Manual

Rev. #	Issue Date	History
0	07/03/06	Rev. for ASCLD/LAB-International (ISO 17025).
1	03/01/18	1 Scope, added, "This document applies to examiners and analysts in the QDU" Deleted 4 Calibrations, Refer to the *QD Quality Assurance, Manual, Maintenance, Calibration and Performance for Equipment Verification* and appropriately re-numbered.

Redacted - Signatures on File

Approval

Questioned Documents Unit Chief — Date: 02/28/2018

Footwear/Tire Tread Technical Leader — Date: 02/28/2018

QA Approval

Quality Manager — Date: 02/28/2018